MATH 7006: PARTIAL DIFFERENTIAL EQUATIONS

SPRING 2020, UNIVERSITY OF CINCINNATI

INSTRUCTOR	Dr. Deniz Bilman
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OFFICE HOURS	T-R 5:00 PM–6:00 PM, R 2:00–3:00 PM, or by appointment, in 2925CGD 524
LECTURES	T-R 3:30 PM–4:50 PM in 60WCHARL 140

TEXTBOOKS

Required text: *Partial Differential Equations*, 2nd Edition, by Lawrence C. Evans. American Mathematical Society, ISBN-13:978-0821849743

COURSE DESCRIPTION & GOALS

This is a graduate-level course on the qualitative study of partial differential equations posed on subsets of n-dimensional space. We will first study four important linear partial differential equations in detail: the transport equation, Laplace's equation, the heat equation, and the wave equation. Then we will move on to the covering first order nonlinear partial differential equations, and various techniques to obtain and methods to represent solutions of the partial differential equations under investigation in the entire course. The techniques for solving the second-order equations will include finding fundamental solutions, Green's functions, maximum principles, and energy methods. This plan amounts to covering the material from Chapters 1–4 of the text book.

There could be details concerning calculus that may be left for you to study, most of which are available in "Appendix C: Calculus" of the textbook. Other appendices are also good and needed — especially Appendix A, which introduces notation.

CANVAS WEBSITE

There is a Canvas site for the course: https://uc.instructure.com/courses/1260672
Please **verify by Friday, January 17** that you are able to access this site. Assignments and grades for the assignments will be distributed through this site.

HOMEWORK

There will be weekly homework assignments (mostly from the textbook). You are *strongly* encouraged to type your solutions using TEX/LATEX. Using TEX/LATEX efficiently is an important skill and this could be a good time to learn or to practice it. Regardless, homework will be collected electronically in PDF format via submission on Canvas. A template file will be provided.

You may work on the homework problems with your peers (and this can be quite rewarding in terms of understanding, so it is encouraged). But the work you turn in must be of your own. Again, the homework is for *you* to learn.

EXAMS

There will be two in-class midterm exams and one final exam.

Advice for Students

Questions are highly encouraged — if something is unclear during class, please ask, ask, ask, ask. This course is *for you*. Review your the notes after each class and make a list of points that are unclear. Ask me about these points either in class or office hours. *Do not postpone understanding something*.

Grading

Homework: 40%	Exam 1: 15%	Exam 2: 15%	Final: 30%

Important Dates

- Last day to drop: Monday January 27, 2020
- Exam 1: **Tuesday March 10, 2020, in class**
- Exam 2: **Tuesday April 7, 2020, in class** — this date is tentative, conditioned on finishing the material from Chapter 3 before this date.
- Spring Break: March 16–20, 2020
- Last day to withdraw: April 3, 2020
- Final Exam: **Thursday, April 30, 2020, 2:15–4:15 PM.**

Disabilities and Conflicts

Any student with a documented disability should contact me as soon as possible so that we can discuss arrangements to fit your needs. **Students with conflicts or special exam-taking requirements should contact me via e-mail, with appropriate documentation, by Tuesday February 4, 2020.**